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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,508	05/16/2006	Peter C. Yaeger	07680.0034-00000	3014

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EXAMINER	
ARIANI, KADE	
ART UNIT	**PAPER NUMBER**
1651	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,508	YAEGER ET AL.	
	Examiner	Art Unit	
	Kade Ariani	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-24 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The preliminary amendment filed on May 16, 2006, has been received and entered.

Claims 1-24 are pending in this application and were examined on their merits.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation "cells produced by the method of claim 1" in claim 15 renders the claim indefinite because claim 1 is "a method of propagating adult mammalian skeletal cells...." and not a method of producing adult mammalian skeletal cells, thus adult mammalian skeletal cells can not be produced by the method of claim, therefore claim 15 is indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless

> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-24 are rejected under 35 U.S.C. 102(a) as being anticipated by Stewart et al. (Journal of Cellular Physiology, May 2003, Vol. 196, p.70-78).

Claims 1-24 are drawn to a method of propagating adult mammalian skeletal muscle cells comprising culturing the cells in a mitogen-rich cell culture medium supplemented with an amount of TGF-β effective to suppress myoblast differentiation, human skeletal muscle cells, effective amount of TGF-β is from 0.01 to 200 ng/ml, the culture medium comprises at least 5% serum, skeletal muscle cells are primary cell culture, cells are passaged, exposure to TGF-β for at least 12 hours, cells are grown to over 30% confluence, cell density of over 0.1 $X10^5$ cells/cm^2, expression of creatine kinase by skeletal muscle cells is reduced by at least 20% relative to control culture propagated without TGF-β, desmin expression is at least 20% lower than that in the culture prior to the addition of TGF-β, cells produced by method of claim 1, cells are autologous, and a method for evaluating the differentiation state of myoblasts in a population of CD56-positive cells in the skeletal muscle cell culture by determining the amount of desmin using fluorescence-activated cell sorting (FACS).

Stewart et al. discloses a method of propagating autologous adult human skeletal muscle cells, for treatment of myocardial infarction, culturing cells in a mitogen-rich culture in the presence of 1 ng/ml TGF-β2, exposure to TGF-β2 for 5 days, myoblast markers CD56, desmin and creatine kinase (see Abstract and Introduction also p.74

Col.1 Line 25), cells are passaged to 70-100% confluent at a density ranging from 8 $X10^4$ to 1.5 $X10^5$ cells/cm^2, (p.71, Col.2, Propagation of HuSkMC), 15-20% FBS (p.71, Col.2, second paragraph, Lines 5-6), primary cells (see p.71 Col.2, first line, cells taken from a 77-year old female amputee), cells were analyzed using FACStar Plus flow cytometer (p.72, Col.1, Lines 28-30), at least 20% decrease in desmin expression in CD56-positive myoblasts (p.75, Fig. 4C), at least 20% reduction in the activity of creatine kinase relative to control (p.76, Fig. 6A), determining the level of desmin expression in a CD56-positive skeletal muscle cell culture to evaluate the differentiation state of myoblasts in a skeletal muscle cell culture (p.73, Col.1, lines 4-20 and Fig. 2B).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Menasche et al. (The Lancet, 2001, Vol. 357, p.279-280) in view of Keski-Oja et al. (Cytotechnology, 1989, Vol.2, p.317-332) and further in view of Lawson-Smith & McGeachie (J. Anat., 1998, Vol.192, p.161-171).

Claim 15 appears to be drawn to skeletal muscle cells per se, all the cited references disclose adult human skeletal muscle cells, therefore the references clearly anticipate the claimed subject matter.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Menasche et al. (The Lancet, 2001, Vol. 357, p.279-280) in view of Keski-Oja et al. (Cytotechnology, 1989, Vol.2, p.317-332) and further in view of Lawson-Smith & McGeachie (J. Anat., 1998, Vol.192, p.161-171).

As mentioned immediately above, claims 1-24 are drawn to a method of propagating adult mammalian skeletal muscle cells comprising culturing the cells in a mitogen-rich cell culture medium supplemented with an amount of TGF-β effective to suppress myoblast differentiation.

Menasche et al. teaches a method of propagating adult human skeletal cells, in a Myogenic-specific culture medium (mitogen-rich medium), biopsy sample (primary cells), cells are passaged, total of 800 X 10^6 cells of which 65% were myoblasts, CD56-

positive cells identified by flow cytometry (p. 279, Col.2, lines 21-28), autologous myoblast transplantation after infarction (p.280, Col.2 last paragraph),

Menasche et al. does not teach culture medium is supplemented with TGF-β, expression of creatine kinase and desmin by skeletal muscle cells is reduced by at least 20%, and a method for evaluating the differentiation state of myoblasts by determining the amount of desmin. However, Keski-Oja et al. teaches TGF-βs (see p.319 Table 1), and further teaches TGF-β inhibits myogenesis by preventing the differentiation of myoblasts, which is characterized by inhibition of myoblast fusion and elevation of creatine kinase (p.325, Ciol.2, Lines 10-13).

Therefore, in view of the above-mentioned teachings, it would have been obvious to one of the ordinary skill in the art to supplement the culture medium with an amount of TGF-β in a method of propagating adult mammalian skeletal muscle cells to reversibly suppress myoblast differentiation. One would have been motivated to supplement the culture medium with an amount of TGF-β in a method of propagating adult mammalian skeletal muscle cells to reversibly suppress myoblast differentiation with a reasonable expectation of success, because at the time the invention was made it was very well known in the art that TGF-β inhibits myogenesis by preventing the differentiation of myoblasts.

Moreover, Lawson-Smith & McGeachie teaches desmin labeling was a very well known technique in identifying myogenic precursor cells in skeletal muscle and determining the differentiation state of myoblasts (see Abstract and p.167 Col.1 and 2), and further teaches clearly there are numerous possible roles for desmin in skeletal

muscle cells and thus the possibility for using desmin as marker for myoblasts in studies of myogenesis and regenerating muscle (p.167, Col.1 Lines 8-12). Therefore, at the time the invention was made one would have motivated to evaluate the differentiation state of myoblasts in a skeletal muscle cell culture by determining the amount of desmin expression with a reasonable expectation of success.

Accordingly, the invention taken as whole is *prima facie* obvious.

Conclusion

No claims allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kade Ariani whose telephone number is (571) 272-6083. The examiner can normally be reached on 9:00 am to 5:30 pm EST Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kade Ariani
Examiner
Art Unit 1651

Leon B. Lankford Jr.
Primary Examiner
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